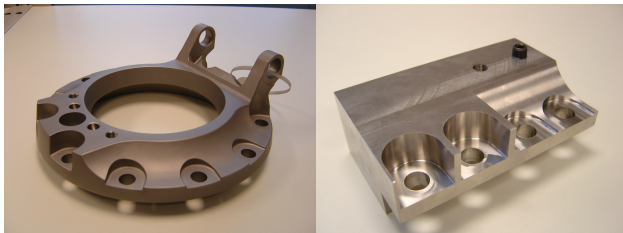


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| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | | | 10. SPONSOR/MONITOR'S ACRONYM(S) | |
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| 12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited | | | | | |
| 13. SUPPLEMENTARY NOTES | | | | | |
| 14. ABSTRACT Lord Corporation (Dayton, OH) manufactures the Main Rotor Bearing for the Sikorsky Black Hawk helicopter. Recently they were awarded a new contract that increases the requirement for this part from 60 to 80 pieces per week (a 33% increase). Lord Corporation operated a 5 days per week schedule. Meeting the new production requirement would require facility utilization of seven days per week. This would not increase labor hours, but no time would be available for machine maintenance. Not wanting to work 7 days a week, Lord Corporation requested that the National Center for Defense Manufacturing and Machining (NCDMM) review the complete process and provide a solution to achieve the 80 pieces per week. | | | | | |
| 15. SUBJECT TERMS National Center for Defense Manufacturing and Machining; NCDMM; Lord Corporation; Success Stories | | | | | |
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PROBLEM / OBJECTIVE

Lord Corporation (Dayton, OH) manufactures the Main Rotor Bearing for the Sikorsky Black Hawk helicopter. Recently they were awarded a new contract that increases the requirement for this part from 60 to 80 pieces per week (a 33% increase). Lord Corporation operated a 5 days per week schedule.

Meeting the new production requirement would require facility utilization of seven days per week. This would not increase labor hours, but no time would be available for machine maintenance. Not wanting to work 7 days a week, Lord Corporation requested that the National Center for Defense Manufacturing and Machining (NCDMM) review the complete process and provide a solution to achieve the 80 pieces per week.



Actual part (left) and the “proof-of-concept” part (right) that NCDMM created to demonstrate new tooling and manufacturing processes to Lord Corp.

ACCOMPLISHMENTS / PAYOFF

Process Improvement

After reviewing the present part process, it was determined that with the new requirements, a part had to be produced in 75 minutes or less. This was based on 80 pieces at 80% machining efficiency running 24 hours per day and 5 days per week. The longest operation on this part required 100 minutes actual machine time while all others averaged 35-40 minutes.

The immediate need was to reduce this operation time to meet the new production requirements. NCDMM recommended “state-of-the-art” tooling and advanced machining techniques. Specifically, these recommendations consisted of newer drills, solid

carbide endmills, face mills, thread mills and reprogramming with advanced cutting parameters resulting in significantly improved machining times.

These improvements reduced the longest operation from 100 minutes to 52 minutes. With additional machining and process refinements, a part could be completed in approximately 45 minutes.

Implementation and Technology Transfer

The project was implemented with the following achievements:

- Reduced tool usage by 38%, (21 tools reduced to 13 tools to complete the part)
- Improved threading operations by 85%
- Improved hole quality and surface finish
- Increased metal removal rate (MRR) on all milling, turning and drilling operations
- Single parts fixturing changed to in-cycle part loading achieved a 50% reduction in parts handling

Expected Benefits

Based on these achievements, the new process will significantly exceed the 80-piece requirement. The machine time now required to produce 80 parts will be less than when 60 parts were being produced using the previous method.

Without these achievements, Lord Corporation would have been faced with working significant overtime or adding production equipment to meet Sikorsky’s higher production demand.

TIME LINE / MILESTONE

Start DateNovember 03
End DateDecember 03

PROJECT FUNDING

NCDMM funding\$10K

PARTICIPANTS

NCDMM
Lord Corporation
Kennametal Inc.

For additional information concerning this project, contact the NCDMM at <http://www.ncdmm.org/>